Do not write outside the box

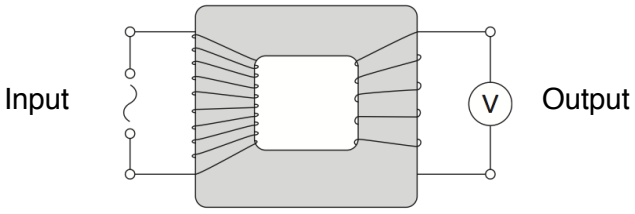
1 Transformers are used to increase and decrease potential difference.

Name the type of transformer that increases potential difference from low to high.

[1 mark]

Step up or step up transformer [1 mark]

1 (a) The diagram shows a transformer that can be used to decrease potential difference. In the UK mains electricity is alternating with a frequency of 50 hertz.



1 (a) (i) Explain how a transformer works.

[4 marks]

An alternating current or p.d. in the primary coil creates a changing / alternating magnetic field [1 mark]

in the iron core [1 mark]

(and so) an alternating p.d. or alternating voltage [1 mark]

is induced across secondary coil. [1 mark]

Make sure you refer to the induced potential difference in the secondary coil, before you mention induced current in secondary coil.

There are important key words in this explanation which are underlined.
Remember the term potential difference and voltage mean the same thing.

1 (a) (ii) The table shows values for the potential difference (p.d.) of the supply and the voltmeter reading for the transformer shown in the diagram.

Input P.D. (volts)	Output P.D. (volts)
8.8	4.4
4.4	2.2
17.6	8.8

Complete the table.

[2 marks]

1 (b) A different transformer is used to provided the correct power to a lamp.

The lamp runs off 4 amps and a potential difference of 12 volts.

The transformer that provides this voltage and current is connected to the mains electricity.

Mains electricity provides a potential difference of 230 volts.

Calculate the current drawn from the main electricity if there is no energy loss.

Use the correct equation from the equation sheet.

[3 marks]

230 x I = 12 x 4 [1 mark]

48 / 230 = I [2 marks]

0.21 or 0.208 [3 marks]

Current = ... amps

1 (c) (i) Switch mode transformers are useful because they use very little power. They operate at frequencies different to mains supply.

What frequencies do switch mode transformers typically operate at? Circle the correct answer.

[1 mark]

0 to 50 hertz | 50 to 200 hertz | 500 to 2000 hertz | 16 gigahertz or higher

1 (c) (ii) Give one advantage of using switch mode transformers in the home.

[1 mark]

Small or light [1 mark]